INTRODUCTION

Primary hyperparathyroidism is a common endocrine disorder that occurs most often as a result of a sporadically occurring single parathyroid adenoma (>85%) and less often due to parathyroid hyperplasia involving all four glands. The only cure is surgical removal of the offending gland(s).

Parathyroid surgery represents a significant portion of endocrine-related surgery performed on patients within the Veterans Affairs Health Care Systems. In a surgical safety review of 128 VA hospitals over a 36-month period, 719 parathyroid operations were found to have been performed. However, the number of parathyroid operations averaged under 2 per year per VA institution during the study period, which did not allow for a systematic analysis of disease- or technique-specific outcomes within a single institution or context.

Diagnostic techniques and surgical management protocols for parathyroid disease have undergone a paradigm shift over the last 10-20 years, with a focus on less invasive surgery and greater dependence on technology for preoperative localization, facilitation of less invasive surgery, and intraoperative confirmation of removal of correct tissue to resolve the disease process. The transition from traditional, bilateral, 4 gland exploration (four gland exploration or FGE) to directed and minimal dissection single gland removal when supported by high-quality preoperative imaging (directed exploration or DE), has been shown to produce comparable success (cure) rates and complication rates. However, there has been little consensus in adopting all or part of the technologies available to facilitate directed exploration, and higher-volume and endocrine-focused surgeons have tended to incorporate more of the newer techniques.

Parathyroid surgical practice at VAMC-Memphis has evolved over a similar time period, and this study is designed to determine whether success (cure) rates have been impacted by surgeon-performed ultrasound for preoperative localization, and utilization of intraoperative PTH. Finally, an algorithm for management of patients with sporadic primary hyperparathyroidism will be developed, based on best practices and outcomes in this institutional context and in this select population of veterans.

METHODS AND MATERIALS

In this retrospective chart review, patients were identified by searching all parathyroid-related procedures which took place at our institution January 1, 2002 to December 31, 2013. Information related to the aims of the study, including demographics, operative details, and laboratory values were recorded. Data was then analyzed using descriptive statistics.

RESULTS

Of those patients with preoperative localization and directed excision, the preoperative studies most predictive of cure were a combination of Sestamibi parathyroid scan and surgeon-performed ultrasound. All patients underwent Sestamibi scan, 30 underwent radiology-performed ultrasound (R-US), 21 underwent surgeon-performed ultrasound (S-US), and 15 received R-US and S-US. In 4/21 instances S-US disagreed with Sestamibi, 3 of which localized the adenoma while Sestamibi did not, and 1 in which the S-US identified the correct location. 6/15 S-US disagreed with R-US. For all patients with discordant imaging studies, S-US correlated with surgical findings. Intraoperative parathyroid hormone rapid assay was not helpful in predicting cure over those patients without iPTH, and added 68 minutes to the operating time on average. Overall, 57/61 (93.4%) patients were cured with respect to normalized calcium, and 14/61 (23%) were eucalcemic with elevated PTH. Preop vitamin D deficiency was prevalent in this population and of the postop patients with normocalcemia and persistent elevated PTH, 42.8% were vitamin D deficient.

CONCLUSIONS

Analysis of techniques that predict a surgical cure allowed the development of a best practices algorithm that includes the following: 1. Obtain 2 preoperative localization studies, including a surgeon-performed ultrasound (S-US had highest correlation with surgical findings); 2. Obtain preoperative vitamin D levels and supplement as indicated; and 3. Reserve intraoperative parathyroid hormone assay only for those patients who do NOT have 2 corroborating localization studies.

REFERENCES